Analyzing the Applicability of Airline Booking Systems for Cloud Computing Offerings

Johannes WATZL & Dieter KRANZLMüLLER

Ludwig-Maximilians-Universität München, DE

Advance booking systems allow users to reserve grid or cloud resources in a certain timeframe or enable the booking of usage time for a grid or cloud service. This analysis describes the potential of utilizing a state of the art revenue management system used in the airline industry for the pricing of cloud service offerings.

Today, advance booking systems for cloud services are introduced by several public and private cloud providers. The pricing models used at the moment are strictly static. This means there are predefined prices for the usage of a resource or a service for a certain time unit (computing: CPU (core)/hour, storage: GB/month, etc).

With static pricing models service offerings and/or the underlying resources appear to be infinite.

Our analysis focuses on Infrastructure as a Service (IaaS) offerings as one of the three dominant domains of cloud computing. Our hypothesis is that a dynamic cloud pricing model based on offer and demand can be mapped almost directly on booking systems utilized by the airline industry restricted to single-leg flights. These systems are based on dynamic pricing, revenue management and capacity planning models.

Assuming an IaaS provider is offering the hosting of virtual machines, the provider’s data centre can be mapped on an airplane with seats in different categories (Economy, Business, First). These categories can be mapped to three different service levels for a service offering (i.e. Gold, Silver, Bronze). The service levels differ essentially in the provided product. (for airplanes i.e. legroom, seats, meals, etc. and for services i.e. guaranteed uptime, dedicated core vs. shared core, backup, migration).

In the airline industry, the three basic products are sectioned by booking classes. There is a minimum and a maximum price for seats allocated in the different categories on a plane or space allocated for virtual machines in a datacenter.
Booking classes allow the consideration of certain restrictions or discounts. They enable the handling of booking cancellation, no-shows, booking changes or refunding.

In the field of cloud services, booking classes can be used for similar objectives, such as changing the time of reservations or the amount of resources, cancellation of reservations and refunding in case of not using the resources.

The main goal of this work is the introduction of a cloud booking system using dynamic pricing, revenue management and capacity planning methods.

Making use of revenue management systems for Cloud products enables maximized revenues and a better and more optimized utilization of the resources which helps to meet current and future GreenIT policies.